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AUTHOR Mellow, Gail O.
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ABSTRACT

The hierarchical organizational structures that exist at community colleges and other institutions of higher education reflect the Late Industrial Era; as organizations make the transition to the Early Information Era, however, these rigid structures can hinder institutions' efforts to effectively utilize information and respond to changing conditions. What is needed is a system that merges the process of faculty decision-making with a bureaucratic system of student registration and admissions. One possible model of this structure is the learning organization, or a structure that allows for learning and change at the organizational level, enables stability in dynamic environments, generates abundant information, and processes information rapidly. In working toward this model, academic chairs must be able to inspire their faculty to change, imagine the whole system, understand the mental models upon which processes are built, and encourage dialogue. Another concept useful in considering structural change is "co-evolution", or the ability of two systems to interact and grow over time. Key to co-evolution is communication; academic administrators need to find ways to increase communication to achieve a rich dialogue and encourage systems to mutually evolve. In the 21st century, community college department chairs will need to respond to the information explosion and constantly changing organizations and technology and use this technology to serve and support 21st century learners and teachers. (AJL)

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The Role of the Community College Chair in Organizational Change: Chaos, Leadership and the Challenge of Complexity

By

Gail O. Mellow
LaGuardia Community College

Paper presented at the Annual Mid-Atlantic Community College Chair/Dean Conference
(2nd, Blue Bell, PA, October 24-25, 1996).

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**The Role of the Community College Chair in Organizational
Change:**

Chaos, Leadership and the Challenge of Complexity

by

Dr. Gail O. Mellow

LaGuardia Community College

Second Annual Mid-Atlantic Community College Chair Conference

Problems that Rock the Chair

Blue Bell, PA October 24, 1996

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The Role of the Community College Chair in Organizational Change: Chaos, Leadership and the Challenge of Complexity

I. Introduction

I would like to thank you very much for inviting me to give this keynote address. The title of my talk today is "The Role of the Community College Chair in Organizational Change: Chaos, Leadership and the Challenge of Complexity." I'm please to be able to gather with such a distinguished group of community college faculty and administrators. The demands are increasing on the academic chair, who is pivotol in the spiraling complexity of public higher education. I would like to congratulate you on your efforts to join together to discuss the issues inherent in this difficult role.

The next decades will be interesting for community colleges. I believe that they will be either wonderful, a time whereby we will truly fulfill the democratic impulse of our very unique form of education, or grim, in which we will follow the steep trajectory of our rise in the 50's and 60's with a steep decline if we fail to coordinate the technological, fiscal, and academic challenges that are before us.

I am speaking to you today, of course, because I am optimistic about our future. More than that, I believe we have a moral imperative to serve our students. If we don't, few other systems are as capable as ours to make a difference in their lives. That is why it is an honor to stand in front of a group of individuals who are committed to the noble enterprise of education.

I've been adjusting to living inNew York City, which can often be a little star-struck and focused on the famous. The other day, the Pope came to New York City. A limo driver pulls up to the curb at St. Peter's to pick him up. The Pope says, "I haven't driven for years, and I love to drive. Why don't you sit in back, and let me drive just for the thrill of it?" The driver says, "I'm really not supposed to do that, Your Excellency." The Pope persists, "Please, I'm an old and sick man. This may be my last

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chance. I just can't do this in Rome. Please, go and sit in the back and let me drive." The driver goes and sits in the back. The Pope drives fast, and then faster. Within minutes, a New York City cop pulls him over, asks to see his driver's license, and then goes back to his squad car. The officer calls the station. I just pulled over somebody really, really big," he says. "How big?" asks the dispatcher. "I don't know who it is," the Officer replies, "But the POPE is driving them around!" Like the Pope, we hope to do things we haven't done before, and like the police officer, we hope to nab the big one. And in large part, that is what I wish to talk about today

As Abraham Lincoln said, "The dogmas of the quiet past are inadequate to the stormy present. As our case is new, so we must think anew and act anew. On the other hand, who here hasn't uttered one of the chair's prayers: "O, Lord, help me to meet this self-imposed and totally unnecessary challenge." Or my favorite chair's prayer "O, Lord, please make my words sweet today, because tomorrow I may have to eat them."

This conference is entitled "Problems that Rock the Chair", and I hope in my talk today to be able to provide you with new ways of thinking about organizational change. One of the profound things I have found is that, often, the best solution to a problem is one that solves YOU. However, change in the academic organization can also be an awful lot like loading frogs into a wheel barrow.

I'd like to embed some assessment techniques into this talk, although given the size of the audience, I will have to treat it more like a traditional lecture. On a sheet of paper that I'll ask you to give to me at the end of the talk, please take a minute to write "What is the one thing about the role of academic leadership in organizational change that you hope I'll cover today?" Now, introduce yourself to a person you don't know, and tell them your question and why you're so interested in it.

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II. The Knowledge Era and Organizational Change

1. Community College Organizational Structures: Locked into Old Patterns

Let me begin by discussing organizational structures. Charles Savage, in a book entitled *5th Generation Management: Integrating Enterprises Through Human Networking*, posits a very interesting model for looking at the form of organizations. He believes that social organizations in the 20th Century have moved from an Early Industrial Era where entrepreneurs gathered labor to create wealth, through a Late Industrial Era where capital merged with steep, hierarchical organizations to create wealth. Savage would say that we are now in the organizational "gap" before we move into the Early Knowledge Era. Knowledge Era organizations, organizations for the 21st Century, will have to gather knowledge through human networking in order to create wealth. The problem is, we don't yet know how to grow organizations that can use information to create knowledge, and then are able to nimbly apply that knowledge. Hence, what Savage terms the gap in organizational design.

Let me give an example of the conundrum I think we are in because of the gap between what we used to do and what we should be doing. In the Industrial Era, faculty did have the time for reflection and contemplation. The slow moving, deliberative process of faculty culture is embedded in most Faculty Senates I have seen in action. But we have also overlaid the Faculty Senates with large and rigid layers of academic administration and bureaucracy. Class schedules must be written for the year, so that students can plan and administrators can get them to the printers. But what happens when the Faculty Senate, rightly, carefully, deliberates in its consideration of a change in academic policy? At one institution, this involved a change in general education requirements that required students to have a new interdisciplinary course. Great idea, right?

But the not-yet-crystallized changes in organizational structures make problems for community college chairs who must work through Faculty Senates. By the end of the year, when the Senate finally approved the change in the general education curriculum and the newly devised course, the schedule for the next year had already been printed. Continuing students had pre-registered, all articulation

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agreements had been developed, all print material for the coming year had been produced. Thus, the first time this important change in academic program could even begin to be implemented was a year from the final decision.

I believe this kind of problem happens continually on today's campuses. The challenge is: how do we create systems of strong faculty voice that focus on the important issues, but do so rapidly enough to impact a system that moves? The task is to meld the dialogic process of faculty decision making with a bureaucratic system of student registration and admissions. I believe a part of the answer involves creating new organizational structures for community colleges.

2. Community Colleges as Learning Organizations

One of the models posited as an organizational structure for the next century is the Learning Organization. Conceptualized by Victoria Marsick, Diana Woolis, Peter Senge, Meg Wheatley, Charles Handy and others, it is a model I think it behooves us to examine. Perhaps most especially for community colleges, I think that this proposed structure holds some important elements. If we are to meet the promise of community colleges, we need organizations that are robust and nimble to negotiate the choppy waters of the 21st Century. Woolis (1994) defines a learning organization as:

- one which allows for and fosters learning and transformation at the organizational level
- enables stability in a dynamic environment and coherence in "chaos"
- continuously develops the capacity to both generate and respond to change
- generates abundant and random information, processes information rapidly and shares it broadly
- acts with consideration for the individual, the enterprise, the range of external stakeholders

The idea of an organization that itself learns, that incorporates the kinds of intellectual habits of mind we hope to inculcate in our students, provides a resonant structural goal. In the following section, I would like to

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hypothesize about the ways in which community colleges could use this organizational structure as a guiding vision.

3. A Vision to Strive for

When I look at community colleges undergoing organizational change it's hard for me to accept that they've rarely done their homework. If the future demands, as Peter Senge (1990) suggests, an organization that is able to articulate its vision, then we also need an organizational vision towards which to strive. Too often colleges move toward re-organization without reviewing the organizational change literature. I was intrigued with higher education's flirtation with Total Quality Management, because it tried to create systems that were data-driven. As such, TQM might be seen as the last best attempt of the Late Industrial Era to build effective organizations. Learning Organization models do more than try to efficiently move the organizational boxes within higher education. Rather, they promote a fundamental re-thinking about the form and function of the organization, often resulting in a transformation of the organizational structure. I'd like to discuss this model as a vision of an organization that community college chairs might want to achieve.

Academic leaders must inspire their faculty. Faculty as prized racehorses — big, powerful, incredibly demanding, with persnickety narrow ankles. But when they perform, they give their heart. No work horse can touch them. You don't inspire a race horse with a lump of sugar at the end of the race, you engage the horse's heart, and everything else fades. As academic chairs, it is up to you to be able to inspire the faculty to become involved in the process of transforming higher education because you have new, provocative, better models. Saying that you need to do more with less is just going to reinforce burn-out. The Learning Organization is one structure that may inspire the faculty to re-think how we deliver education.

I would exhort academic chairs to familiarize yourself with the characteristics of 21st Century Management. Let me give you a few examples. Here are some of the characteristics that Senge, Wheatley,

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Woolis, Marsick and Handy suggest are needed to move our organizations to the 21st Century:

- Systems Thinking - an ability to look at the whole of a system. Don't just examine how faculty should or shouldn't be involved in academic advising, look at the totality of a student's interaction with the college in getting information. Look at how systems relate. Then, devise an academic advisement system.
- Mental Models - an ability to surface the imbedded and implicit mental models upon which systems are based. A university of California school believed in personal service. Because of that belief, they never instituted phone registration. This resulted in students standing in long lines. Personal service? No, but no one had really surfaced that mental model that prevented the college from re-imagining its registration process.
- Dialogue - the ability to keep alive divergent perspectives as long as possible in a discussion before solutions are determined. I have seen heavy handed presidents and deans root out any difference of opinion, and faculty senate decisions turn on the glib tongue and surface put down. We need to deeply embed diversity of opinion into our deliberative processes. I have used groupware in the process of working with an entire faculty to create general education goals. Because of the anonymity, there were actually personal attacks on me that were a part of the dialogue (e.g., "How can we do anything about general education if the Academic Dean doesn't give us more release time? She's just wasting our time again."). But the freedom to disagree personally and professionally resulted in a robust set of general education requirements.

Think about some of these characteristics, and then think about an organization that got smarter as it got older. Wouldn't that be an incredible thing? And if that is the template of the future, colleges in general, but community colleges in particular, have the ability to position themselves at the head of the line. We're full of smart people, and we have a history of consultation. What we need are new models of organizational practice and visionary leadership from academic chairs to move institutions forward.

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4. Science and Organizational Models

Kevin Kelly (1994), in his book *Out of Control*, talks about contemporary science and his belief that there will be a merging of biological and human-made technical systems. He has something to offer us as we seek to frame the organizations of the 21st Century for community colleges. I will quote from him liberally in the next few paragraphs. Old style hierarchical organizational structures require control, but 21st Century organizations will require us to build organizations that are aligned but free. Kelly maintains that there are "emergent properties" within superorganisms that supersede the "resident properties." Kelly calls this a "hive mind." He uses the ability of swarms of bees or ants to act collectively as a model for what happens when complex holistic behavior lawfully emerges from the limited behavior of the parts. I would suggest that we learn to nurture and harness the power of the "emergent properties" of colleges. No one classroom can produce the level of integrated thinking and aptitude that we require for our students, but higher order complexity can come from connecting the parts. One of the challenges for academic leaders in the community college is how to make those connections, how to ensure that an associate's degree "adds up" to something, and how to create a synergistic, sequenced set of academic skills among students who attend our colleges episodically.

Communication has to be like oxygen in the new organizations—free, abundant and taken for granted. As academic administrators, we have to find ways to increase communication while not overwhelming individuals. I have never been on a campus as a consultant or as the chair of a regional accrediting team where I haven't heard complaints about communication. I want to spend the next few minutes reviewing the science that Kelly analyzes as a way to re-think the communication problem. In general, I want to review his concepts of systems and evolution, and speak to how this model holds promise for new communication structures in community colleges.

"Co-evolution" is the ability of two systems to interact and grow over time. Monarch butterflies developed in a co-evolutionary manner with milkweed—neither species can exist without the other. Think of what it would mean if registration and academic advising, or degree program development and economic development, or the integration of learning

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technology and learning outcomes accountability, was modeled on co-evolution. In co-evolution, historical epochs are interrupted by sudden, short-lived episodes of instability, when old species become extinct and new ones took root. At this point, a new stable arrangement of new species arose and persisted. This is termed punctuated equilibrium—punk eek.

This is one of the things we need to seek as academic administrators bringing our institutions into the 21st century—go forth and produce PUNK EEK!! How can we create communication systems that support co-evolution of our colleges? We must have the ability to understand chaos and change, and to expect disruption and periods of things getting WORSE than before the change. When a college I was affiliated with began telephone registration, several students got a recorded message that said, because of financial aid requirements, they had to register for 2100 credits! The systems was initially more chaotic than in-person registration, but ultimately students were delighted. We need to think about how to move toward better communication through the co-evolution of systems of committees, governance, technology, and the hallway.

It also means that if you're about to change, a co-evolution model requires that you inform everyone, even your competitors, about your strategy so that they can adapt to it. In the Knowledge Era, dense communication is creating artificial worlds ripe for emergent co-evolution. Did you know that there is a company in New York and California that specializes in reviewing the academic transcripts of individuals within a company in order to counsel them on the quickest way to a degree? Wouldn't you want them to know about the articulation agreement you are attempting with a local 4 year college? This has deep implications for community college chairs who are considering changing degree requirements, or systems of post-tenure review. We need to find ways to communicate this in advance, get rich dialogue, and encourage systems to mutually evolve.

Kelly reminds us that, to establish co-evolving systems, organizations must allow for natural flux. In order for a system to change, you must produce and accept disequilibrium. To enrich a system, you need variance in time and space, all the while acknowledging that too much change will kill you. Systems will evolve if there are clear parameters in

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terms of goals, and then administrators learn to back off. In an age of smartness and super-intelligence, the most intelligent control methods will appear as "uncontrol" methods. Communication, then, is one of the most essential elements of organizational change through an evolutionary process.

As a system of community colleges nation-wide, we have to learn the patterning of change that works for our faculty and our students. Marine biologist Lloyd Gomez, producing artificial reefs, found a common failure was trying to stuff more species of life into a habitat than a system could carry, or not introducing them in the correct sequence. No matter how long they lived, each bottled system required an initial staging period when anything might happen...the beginnings of complexity rooted in chaos. Gomez and many biologists found that turbulence is an essential catalyst in ecology. "Pop" is the term saltwater aquarium hobbyists use to describe how a new fish tank suddenly balances after a long, meandering period of instability. To ease the tank through periods of acute imbalance, the acqurist nudges the system gently with all sorts of changes—water, chemicals, bacteria, etc. Then, after about six weeks of microbial give-and-take, suddenly, overnight, the system "pops" to zero ammonia. It is now ready for the long haul. Once the system has popped, it is more self-sustaining, self-stabilizing, not requiring the artificial crutches that set-up needed. This is the process we need to establish on our campuses. We need to nurture new processes and ideas in a sequenced process, allowing for initial instability, but with the faith that new stable models will emerge if chairs are able to supply the nascent systems.

The brilliant academic will seek the balance that lets their system "pop." A chair must be able to tolerate ambiguity, and yet be scrupulously clear about where you're headed. You must learn to maximize the inherent power and emergent potential of many smart people pulling in the same direction so that a system can evolve. Danny Hillis, a computer scientist, developed a software program that wrote software programs so that both the program to "sort" for better programs and the programs themselves could evolve. That is, both the system produced and the criteria by which to measure the system evolved. This is a model for a new brand of academic administration. We must find mechanisms of robust feedback that produce more highly efficient

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systems--say of registering students-- that must respond to increasing standards of proficiency--say, of students being advised and registered.

How can chairs being to bring together the kinds of things that will create the artificial reef, that will make the system "pop," that will allow for the co-evolution of systems into complex and flexible systems that will carry us to the next century? One of the keys, I believe, is to understand the power of networking. Stuart Kauffman, a brilliant theoretician of complexity theory, is interested in how complexity builds itself out of small, non-complex constituent parts. He plays with computers in order to simulate this process. What he discovered is that, when the average number of links between nodes in a network system increases, systems become resilient, bouncing back when disturbed.

But he also found that, beyond a certain level of linking density, continued connectivity would only decrease the adaptability of the system as a whole. Kauffman graphed this effect as a hill. The top of the hill was optimal flexibility to change. One low side of the hill was a sparsely connected system: flat-footed and stagnant. The other low side was an overly connected system: a frozen grid-lock of a thousand mutual pulls. In the long run, an overly linked system was as debilitating as a mob of uncoordinated loners.

It's my belief that community college systems that I have seen belong to either pole, but have not yet found the way to the middle. I believe that this is the job of the next generation of academic chairs...finding ways to link the faculty, staff and systems without overly linking them. I believe that what these scientists are calling evolution or co-evolution, the social scientists and management researchers would call the Learning Organization. The challenge I would place before you is how to take these theoretical concepts and construct a community college ready for the next century. And communication among the individual parts, without over connecting the system, is key. The inability of evolution to take place without adequate over-lapping, parallel connections among many individual might provide an explanatory model for the disconnect often seen between administration and faculty. Administrations try to hook faculty into systems serially, individually linking faculty into the academic system. We want everyone working within our administrative structures, filling out the correct paperwork, lining up their work. But faculty are working in parallel systems, randomly interacting as

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free agents in classrooms over and over again. We haven't tapped the power of the simultaneity of their working in the system. Without clear metrics of where we want our colleges to go, the potential inherent in the possible co-evolution of faculty/student learning and organizational learning has gone untapped.

We need to find ways to allow our organizations to evolve quickly and effectively; we don't have eons of time. Academic chairs can seed breakthroughs by merging simple systems into more complex ones. A small amount of symbiotic coordination at the right time can replace an eon of minor alterations. For example, are we at a time in the history of community college organization that we need to combine learning communities, supplemental instruction, tutoring, and skills reinforcement into integrated wholes instead of well working stand alone systems? What would happen if we did so?

Before I go on, I'd like you to take another minute, and, on that same piece of paper, write about the thing that you've responded to most strongly in this talk....either positively or negatively. I'll ask for these papers later.

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III. Informational Technology and the Transformation of Higher Education

1. The Changing Nature of Knowledge and Work

Michael G. Dolence and Donald M. Norris (1995) have written a visionary monograph entitled *Transforming Higher Education: A Vision for Learning in the 21st Century*. Again, I am going to quote very liberally from their monograph, which I encourage you to read and ponder. They posit that the move to the Knowledge or Information Age will change higher education profoundly, more than the industrial revolution. The change will be profound because the basic unit of our operations -- learning, knowledge and our relationship to knowledge -- will be altered by the technology.

Higher education, they argue, has the potential to occupy the pivotal role in the future, if institutions appropriately align their activities. They predict that, by the year 2000, an additional 5 million students will need to be educated from all sectors (private, industry training, etc.) Education is at a crossroads. Higher education has aligned its systems and operations to the out-dated needs of the Industrial Age, focusing on the classic of production factors of inputs, processes, and outputs. Colleges seek to credential the quality of inputs and processes rather than measure outcomes.

The 21st Century will require higher education to accommodate to the Information Age. We can predict learning, knowledge and scholarship will all be changed in this era by extrapolating from several factors. One factor is the information explosion. The amount of specialized knowledge being developed in disciplines will change so much that the need for retooling will decrease to 3-5 year cycles. Graduates must have the capacity to learn throughout their careers simply to keep up with current information. Network scholarship will allow for on-line discovery. This direct connection increases the "bandwidth" of information that can be synthesized by any individual and shortens time frames for new knowledge generation, testing, or synthesis. It also potentially widens the gap between cutting edge professional information and the teaching of information; between scholarship and

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practice. How community college faculty respond to the changing nature of scholarship is instrumental to our ability to make our introductory and 200 level courses relevant and current.

Information synthesis will be the basis upon which most of the new learning will rest. With increasing amounts of information, it is crucial that the ability to synthesize becomes a continuous process and a central focus of both faculty development and student skill building. Knowledge, information and scholarship will require that students and faculty develop finely honed skills as knowledge navigators, able to seek and use information with greater and greater levels of skill. Think of the implications these changes have for pedagogy, for our libraries, and for our career and vocational course delivery mechanisms. All of these emergent factors lead to the conclusion that higher education must change in response to the Information Age.

The needs of the individual learner will be changed by the information age. Learning will occur at the time, place and pace of an individual's choosing. Learning will be self-paced and provided in various styles. Students will be able to obtain learning objectives in ways that can vary dramatically from person to person, and within modalities of delivery.

The Information Age will also change the nature of work and learning. Dolence and Norris believe we will see in this decade the death of the job and the emergence of the "knowledge worker." Higher education must learn to deal with fast, fluid, and flexible organizations; organizations where constantly changing job titles and functions will be common. The result will be in new patterns of learning, because more workers will need specific information and learning in order to function effectively in their changing work environments.

Higher education will also have to contend with competition from different arenas. In many instances, technology companies, community-based partnerships, multi-organizational alliances, and college-based associations will all be offering learning opportunities. The challenge of the next decades will be who offers the best learning, and what kind of accreditation learners will need. For many community colleges, the competition for our traditional sector of work-place learning may be some variation of "Bill Gates University." I predict that he will be a formidable competitor. It is also possible that community colleges will no

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longer be able to be the sole degree or credit provider as the competition heats up. The ubiquitousness of the network, and students' potential access, will create a very different organizational structure for the delivery of education. Academic chairs must be aware of these potential future scenarios, and begin to create developmental activities and structures to support their faculty to face these challenges.

2. 21st Century Learners

Futurists argue that the network, as model and practice, will gain primacy. Institutions must develop infrastructure and support mechanisms to encourage adaptation of network practices. If these predictions are true, they drive several conclusions. The first is that we might predict that the network will be a primary delivery mechanism for educational materials of the ultimate "distance free" education (distance will be irrelevant). Because the 21st Century learner will be different, higher education must reconceptualize its organizations around essential outcomes. Our ability to account for, measure, and ascertain the quality of students learning will be both paramount, but increasingly difficult, as learning is fragmented over space and time.

Academic administrators will face new challenges in supporting the 21st Century learner. Technology will require continual enhancement, forcing choices among scarce resources. While these choices are difficult, there are also exciting potentials for the community college who is able to invest in technology and reap "technology synergies." Dolence and Norris suggest that the connection between technologies listed below will create a radically new playing field for the delivery of higher education. They say that much will be gained from the interaction between the following:

- Ubiquitous Networking which integrates voice, video, data, and telecommunications into a single unit with transparent boundaries.
- Enabling Operating Systems which fully integrate academic/administrative systems. Such systems are likely to include powerful smart cards for student learners; and enhanced input/output capacities for kiosks, work stations, personal digital assistants, and knowledge navigators. These will

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exponentially explode students' access to a range of curricular and service offerings.

- Learning and Collaborative Applications which provide personalized systems of learning and learning management, interactive multi-media learning tools, and text/video customization on demand. Imagine the LPN nursing student who, knowing that she learns best with video, and based on her twelve years of experience in a geriatric nursing facility, asks that the video for the LPN-ADN "express" examination be customized to focus on the non-geriatric components of the knowledge she needs. This kind of interactivity might enable students to reach into knowledge networks for any type of academic service, and allow campuses to reach students for "intrusive" advising if their progress is not appropriate.
- Networked experts - faculty, tutors, and advisors could be linked and available under pre-determined conditions and screens. The argument I have heard so many times over who should do academic advising --- faculty or counselors --- could be made moot by always having both available electronically.

Community colleges have always prided themselves on their responsiveness to the adult student, and in particular have supported life long learning. Dolence and Norris suggest that this concept is about to go ballistic! They talk of the process of perpetual learning. This is "life-long learning plus." They predict that learning systems will fuse so that elementary, secondary, apprenticeship training, college, graduate and post-graduate will have fluid boundaries based on student's "demonstrated mastery." Students may use the same learning-ware to access higher and higher levels of knowledge. Students will also access increasing sophisticated Personal Learning Diagnostics. These tools should be able to diagnose the type of learning modality best suited to an individual, and then assist a student in choosing among electronic offerings which tailor academic delivery services to the student's preferred modality.

If the blurring and extension of traditional boundaries of higher education are to occur, the focus on certification of learning mastery will increase in importance. State legislators in many states, including my state of New York, continue to press for simple (one might sometimes argue simplistic) measures that differentiate learning success at different

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campuses. But the kind of student accountability needed for 21st Century Learners is much more demanding. Multiple measures of performance, and certification of mastery, will be pivotal. This may ultimately prove a boon to community colleges. The "value-added" aspect of our services for students is significant, and measures which more rigorously detail the changes will bode well for community college faculty.

In the future, we will have to customize our point of access pay plans. They will need to be able to generate fee bills as colleges deliver network scholarship anywhere, anytime, for any subject. We might also differentially charge for tailored educational delivery to individual learners. Community colleges will need to be able to measure performance and certify outcomes, often for learning that was acquired in systems other than as the certifying campus.

If community colleges of the future develop seamless personalized services and educational systems, we will provide ways for students to navigate between learning resources on different nodes. This would require a college to be able to develop a learning plan that might use on-campus instruction, campus controlled distance instruction, and workplace or other out-sourced instruction to integrate an achievable learning outcome goal. To help community college students use these systems, we will also need to maintain and access personal diagnostics, performance portfolios, and educational plans. Think of the power of an electronic diagnostic system that tracks student performance in basic skills, cognitive achievement, and applied content knowledge. Such a system might flag a student who was entering an emergency medical technician degree program. He could move a B- in his algebra class as an average, but was actually deficient in the kinds of algorithms needed to swiftly handle the computations necessary for his work on the ambulance. An on-line brush-up that focused solely on the algorithms needed might be prescribed, improving his ability to pass the EMT exams, and to care for you and I in an emergency.

We will need to eliminate barriers between administrative and academic systems. If your campus is like the ones I've served on, we have legacy computer systems in both academic and administration which are separate and rarely, if ever, speak to each other. The 21st Century learner will require that our institutions be able to link financial, demographic, learning progress and other kinds of information.

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Traditionally, we collect and use these data streams in narrow silos which prevent data from being linked, and which make questions asked across different activities very difficult to answer. The blurring or elimination of barriers between administrative and academic systems may allow us to view data in context in a way previously not thought of. If we begin to conceptualize the 21st Century learner as a perpetual learner, one who will need a sequenced set of abilities to successfully collect and apply knowledge, our ability to register, prescribe, evaluate and bill for these experiences calls for new kinds of data information systems.

All of this means that we will have to forge 21st Learning Organizations out of our current community colleges. We must push out current boundaries, using technology not just to deliver talking heads to interactive classrooms, but to do on-line assessment, credentialing and measurement. We need to focus on the kinds of outcomes our students will need in perpetuity, and this will often focus around the ability to synthesize information individually or at the group level. This process should cause us to profoundly re-examine the roles of faculty, students, and support staff.

3. 21st Century Teachers

In several areas, and I am most aware of CUNY just because it's where I live, faculty are fearful of distance education technology and its potential impact on the need for faculty. But redefinition of faculty roles, responsibilities, and productivity standards do not necessarily mean an overthrow of tenure and huge cadres of adjunct faculty, although these are possible dystopic futures. Let me outline a few of the positive benefits that might accrue if faculty roles are placed in a technology context that honors faculty expertise and supports student learning.

We've all heard the adage that we must change faculty roles from "the sage on the stage" to the "guide on the side." Active learning, collaborative pedagogy, applied learning are all aspects of increased student participation which require changes in faculty strategies. Faculty are turning from lecturing as a method of delivering information to interaction as a way to connect with students and encourage their learning. Technology will further amplify this tendency. As we and our students become swamped with information, faculty roles will increasingly turn towards synthesizing information in their field. Faculty will review not

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only information but information sources, and assist students in validating which sources of information should be used. As students begin to craft highly individualized learning pathways, faculty will become curriculum architects. They will design learning structures for individual learners by setting criteria and specifying evaluative tools and performance standards. During this learning process, it is more likely that faculty will become mentors, assisting students to sort out relationships among discrete pieces of information, understanding information within a context of basic and higher order concepts, and knowledge navigation strategies in ways that classrooms, regularly scheduled labs, and texts have done in the past. Finally, faculty will be called on in their new roles to be evaluators and certifiers of content mastery. They will be expected to evaluate skills and knowledge in "unbundled" forms, and may be requested to evaluate students whose learning they did not provide. Academic chairs at community colleges must begin now to help faculty move toward these new roles.

If these changes in faculty roles occur, they will require concomitant changes in student roles, changes that most faculty would welcome. Students in the technologically transformed academy will need to be active learners, responsible for their own learning outcomes, with clear of vision about how to remain connected to their self-created education plan. Students will need to be more like pilots, responsible for identifying where they want to go and accessing those systems that provide a mechanism for getting the education they envision for themselves.

This means that chairs, and all academic administrators, must change too. They must become more like general contractors, shaping the construction of a technology infrastructure and knowledge navigation networks. Their role will increasingly entail assembling the appropriate faculty, academic support staff, information technologists, technology vendors and other strategic allies to provide the technological foundation required for next century learners. We will also need to fundamentally rethink basic administrative processes, developing self-informing and self-correcting systems of administration. To do this, academic administrators must begin to look at new kinds of performance indicators. Currently, administrators look at things like the number of students graduating, the number of students in each major, the percentage of full time to part time faculty, the relative administrative

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cost per FTE, etc. A twenty-first century administrator should concentrate on tracking such things as a student's ability to communicate one-on-one with faculty, student access to unlimited library and global information networks, the flexibility of the curriculum, the number of payment options, the openness of the scheduling process, how much support the campus can offer for truly life-long learning credentialing, the mastery of subject matter demonstrated by students after their education, and the nature of the personal attention available from faculty mentors and guides. Thus, as we ask faculty to transform their practice, we administrators must transform our functions as well.

4. Transforming Higher Education

How does a chair help move her or his administration towards some of these visions? Norris and Dolence offer some very basic suggestions that are at once practical and potentially revolutionizing:

- apply network scholarship to the undergraduate experience
- develop and reward transformative leadership in curriculum, processes or administration
- reward success stories
- foster experimentation
- use electronic village pilots to integrate K-12 and post-secondary learners
- work with technology companies to envision truly transformative applications
- demand fully integrated, open, transformative systems
- work with stakeholders to establish transformative expectations and provide funding for expanding the learning base

But where will community colleges be in this brave new technical world? I think that academic chairs have to think seriously of not only how to prepare our faculty to teach, and how to structure our administration to serve in this high tech world, but to also consider the potential danger for our students. Susan Hiltz of New Jersey Institute of Technology in an analysis of the effectiveness of distance learning, finds "Results are superior in the Virtual Classroom for well-motivated and well prepared students who have adequate access to the necessary equipment and who take advantage of the opportunities provided for increased interaction with their professor and with other students, and for active

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participation in a course. Students lacking the necessary basic skills and self-discipline may do better in a traditionally delivered course. Whether or not the virtual classroom mode is better also depends crucially on the extent to which the instructor is able to build and sustain a cooperative, collaborative learning group." How many community college students will be able to function effectively in the high tech classroom of the future? And if they can't, how can we as academic leaders ensure that the high technology classroom provides the human interaction and support so many community college students need?

Martin Luther King said "The function of education...is to teach one to think intensively and to think critically. But education which stops with efficiency may prove the greatest menace to society. The most dangerous criminal may be the man gifted with reason but no morals. We must remember that intelligence is not enough. Intelligence plus character - that is the goal of true education. The complete education gives one not only the power of concentration but worthy objectives upon which to concentrate." If we, as community college administrators, are not aware of the perils of the coming changes wrought by technology, we may lose our ability to shape the character of our students.

How can academic administrators bring a visionary perspective to our community college? My flip but deeply felt answer is "in every way." We're in the business of education because we believe in it. It's what we care about. It's an enormous part of what we do every day. I exhort you to find time to read, think and study about the future, understand the science of organizational change, and develop ways to implement it. Kevin Kelly and Peter Senge and Meg Wheatley and Mike Dolence have only vague ways of applying these concepts to organizations. I think community colleges are the best organizational structures to bring these concepts fully into the future. Engage in the study and practice of change.

Let me end my talk with a quote from a book entitled *The Abandoned Generation: Rethinking Higher Education*, by William Willimon and Thomas Naylor:

"A good teacher has enough confidence in the ultimate human value of his or her discipline not to mind changing other people's lives for the

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sake of it. Great courage is required to be a good teacher, the courage born out of the conviction that if our students will read these books, will learn these skills, will adopt these scholarly disciplines, they will become better persons in the process. By offering to teach more and to make themselves more available to students, professors can provide the necessary leadership to reinvigorate undergraduate education."

I think this is true of teaching, and of administration. I believe the chairs in this room have the will and the savvy to revolutionize higher education. And I can't wait until you do it.

Remember: the road to success is always under construction! I wish you much good will in your endeavors to move community colleges into the future.

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